

writing and illustrating scientific papers, it was stressed that not only must a scientific paper have something to say, but it must say it in an organized fashion, concisely, and with unequivocal clarity; students were referred to current biological periodicals for specific examples.

Oral reports on research projects occupied three successive mornings of the final week of class. These talks were attended not only by all members of the class and faculty, but also by other graduate students and investigators in residence at the Marine Station at the time. An effort was made to hold the talks under circumstances approximating those of a regular small scientific meeting. Individual reports were limited to one-half hour each, and were accompanied by illustrations and graphs from student papers, projected by means of an opaque projector. The reports went very well. For the most part they were organized and had been rehearsed, and were

delivered in a manner comparing favorably with that of professional scientists at meetings. We were exceedingly proud of student performance here.

All of the remaining time during the last week went into criticism and revision of the written research reports. Despite instructions, most of the written reports resembled first drafts of undergraduate term papers rather than scientific manuscripts. The best were none too good, while the worst were longwinded, chatty, poorly organized, and frequently incoherent. The papers were gone over in student-advisor conferences, criticised in real detail, sentence by sentence, torn apart and reorganized, and sent back for rewriting. The rewritten version was also criticised, and often sent back for further revision. Those papers which passed the review of the faculty, and that of the editorial board of *The Veliger*, are presented in the following pages.

On Growth and Longevity in *Tegula funebris*

(Mollusca : Gastropoda)

BY

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(Plate 1)

ALEX COMFORT (1957) has reviewed the literature on the life-spans of mollusks, and has gathered together the published longevity records for members of the phylum. Reference to his listing reveals that the more long-lived forms fall into two categories: (1) Bivalves, in which age can be estimated with fair confidence from annual growth rings on the shell, and (2) the more primitive marine gastropods, in which age determination by annuli has been generally unconvincing and is instead usually inferential from growth rate data and/or size-class groupings. It is the purpose of the present paper to offer evidence which suggests rather forcefully that the black turban snail, *Tegula funebris*, has a life-span greater than that recorded for any other gastropod, and that, unlike other members of the group, the ages of individuals of this species (at least in the population studied) may be approximately determined by counting growth lines.

During the 9-month period from October through June, 1959-60, a population of *Tegula funebris* was studied at Sunset Bay, Coos County, Oregon, in an attempt to determine the annual pattern of growth and mortality. The problem was suggested by Dr. Peter W. Frank of the University of Oregon, and the work was carried out under his guidance and with funds from the undergraduate research participation program of the National Science Foundation.

Unfortunately, the establishment of a long-range study program utilizing large sample sizes was frustrated through lack of a successful technique for marking and recapture. Two sorts of tagging methods were attempted on the 880 animals eventually released. Initially, numbered monel alloy tags (fig. 2) were attached near the lip of the shell by drilling small holes with a high-speed electric tool and dental bit. Subsequent observations on the 600 animals

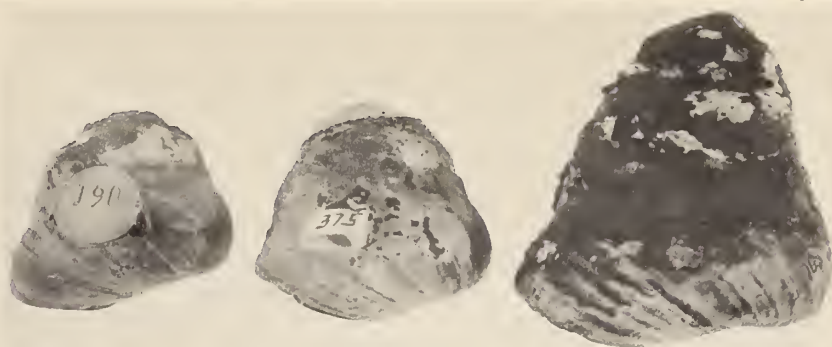


Figure 1



Figure 2



Figure 3

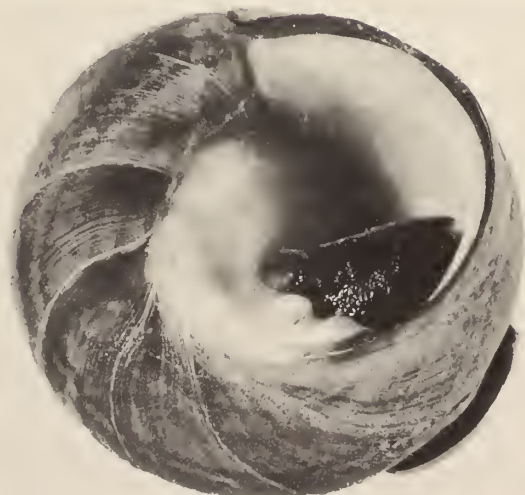


Figure 4

Three specimens of *Tegula funebralis* for demonstration of slow rate of growth and appearance of growth lines. Explanation in text.

Photographs by Bernard Freemesser.